

LISTING OF CLAIMS

Claim 1 (Previously Presented) A process for preparing xylylenediamine comprising continuously hydrogenating liquid phthalonitrile over a heterogeneous catalyst in the presence of liquid ammonia in a reactor, in which a portion of the reactor effluent is recycled as a liquid circulation stream continuously to the reactor inlet (circulation mode), which comprises conducting a stream of a phthalonitrile melt in liquid form by means of a mixer unit into the circulation stream around the hydrogenation reactor, the phthalonitrile conversion in the reactor on single pass being greater than 99%, and the circulation stream consisting to an extent of greater than 93% by weight of liquid ammonia and xylylenediamine and not comprising any further solvent for phthalonitrile.

Claim 2 (Previously Presented) The process according to claim 1 comprising hydrogenating isophthalonitrile in order to prepare meta-xylylenediamine.

Claim 3 (Previously Presented) The process according to claim 1, wherein the mixer unit is heated at the point of the phthalonitrile supply into the circulation stream to a temperature in the range from 1 to 40° C. above the melting point of the phthalonitrile used.

Claim 4 (Previously Presented) The process according to claim 1, wherein the liquid phthalonitrile is sprayed into the circulation stream by means of a mixer nozzle as the mixer unit.

Claim 5 (Previously Presented) The process according to claim 1, wherein the phthalonitrile conversion in the hydrogenation reactor on single pass is greater than 99.5%.

Claim 6 (Previously Presented) The process according to claim 1, wherein the phthalonitrile conversion in the hydrogenation reactor on single pass is greater than 99.9%.

Claim 7 (Previously Presented) The process according to claim 1, wherein the circulation stream consists to an extent of greater than 94% by weight of liquid ammonia and xylylenediamine.

Claim 8 (Previously Presented) The process according to claim 1, wherein the circulation stream contains in the range from 25 to 90% by weight of liquid ammonia.

Claim 9 (Previously Presented) The process according to claim 1, wherein the portion of the liquid reactor effluent which is recycled as the circulation stream continuously to the reactor inlet makes up from 20 to 95% by weight of the overall liquid reactor effluent.

Claim 10 (Previously Presented) The process according to claim 1, wherein the weight ratio of phthalonitrile feed stream to circulation stream is in the range from 0.03 to 1.0.

Claim 11 (Previously Presented) The process according to claim 1, wherein the hydrogenation is carried out at a temperature in the range from 40 to 150° C.

Claim 12 (Previously Presented) The process according to claim 1, wherein the hydrogenation is carried out at an absolute pressure in the range from 100 to 300 bar.

Claim 13 (Previously Presented) The process according to claim 1, wherein the hydrogenation is carried out over a catalyst comprising Ni, Co and/or Fe, as an unsupported catalyst or on an inert support.

Claim 14 (Previously Presented) The process according to claim 1, wherein the hydrogenation is carried out over a manganese-doped unsupported cobalt catalyst.

Claim 15 (Previously Presented) The process according to claim 1, wherein the catalyst is disposed as a fixed bed in a tubular reactor or tube bundle reactor.

Claim 16 (Previously Presented) The process according to claim 1, wherein the reactor is operated in trickle mode.

Claim 17 (Previously Presented) The process according to claim 1, wherein the reactor is operated adiabatically.

Claim 18 (Previously Presented) The process according to claim 1, wherein heat is withdrawn from the circulation stream in a cooler.

Claim 19 (Previously Presented) The process according to claim 1, wherein the xylylenediamine is purified after the hydrogenation by distilling off the ammonia and also any relatively low-boiling by-products overhead and distillatively removing relatively high-boiling impurities via the bottom.

Claim 20 (Previously Presented) The process according to claim 19, wherein the xylylenediamine is extracted after the distillation with an organic solvent for further purification.

Claim 21 (Previously Presented) The process according to claim 20, wherein cyclohexane or methylcyclohexane are used for the extraction.